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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LAM, ANN Y

ART UNIT PAPER NUMBER

1641

DATE MAILED: 08/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/973,629

Applicant(s)

CHENG ET AL.

Examiner

Ann Y. Lam

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 79-110 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☒ Claim(s) 94 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Objections***

Claim 94 is objected to because of the following informalities: the first "out" in line 2 should be --to--. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 97 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 97 recites that the chip further comprises an electromagnetic element.

Claim 97 depends from claim 95, which recites a traveling wave magnetophoresis structure. It is not clear whether or not the electromagnetic element recited in claim 97 is part of the traveling wave magnetophoresis structure recited in claim 95. For examination purposes, the electromagnetic element in claim 97 is considered part of the traveling wave magnetophoresis structure in claim 95.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 79, 81-95 and 97-110 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pourahmadi et al., 6,440,725.

As to claim 79 and 109, Pourahmadi et al. disclose a biochip system wherein at least one of the chips (col. 2, lines 27-33) is a multiple force chip (col. 19, lines 17-19, and col. 25, lines 45-50 and figures 6 and 7, disclosing resistive heating element 34 on the bottom surface of substrate 22, and col. 21, line 35 – col. 22, line 2, disclosing electrodes in contact with fluid for manipulation of molecules),

wherein the multiple force chip comprises multiple functional elements in different structurally linked layers that are capable of being vertically oriented with respect to one another (the resistive heating element 34 is disclosed on the bottom surface of the substrate, below the fluid channels, and the electrodes are disclosed as being in contact with the fluid, that is, in the fluid channels, vertically oriented with the resistive heating element),

and further wherein the biochip system can perform two or more sequential tasks (heating and moving molecules), including a processing task (heating),

and further wherein the multiple force chip comprises at least one particle switch, comprising electrodes (see col. 21, line 56 – col. 22, line 2) that are independent of one another and can move particles along different pathways.

However Pourahmadi et al. do not teach that the particle switch comprises three sets of electrodes. Pourahmadi et al. however teach that two or more electrodes (col.

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21, line 58) for the purpose of moving molecules (col. 21, lines 60-63). Also, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. In this case, Pourahmadi et al. teach the general conditions of the claim, and Pourahmadi et al. also suggest that more than two electrodes may be used. Using three sets of electrodes is within an optimum or workable range and thus its discovery involves only routine skill in the art.

As to claim 81, the multiple force chip further comprises an electromagnetic element (col. 18, lines 40-50.)

As to claims 82 and 98, as indicated earlier the discovery of optimum or workable number of electrodes involves only routine skill in the art. Thus, one of the multiple electrodes is considered to be the electrode recited in claim 82.

As to claims 83, 85, 99 and 101, a traveling wave dielectrophoresis electrode array (col. 21, line 56 – col. 22, line 2) is disclosed. The Office notes that some of the electrodes of Pourahmadi et al. are considered to be part of the traveling wave dielectrophoresis electrode array and some of the electrodes of Pourahmadi et al. are considered to be part of the particle switch. Applicant has not claimed the particle switch in such a way that it is distinguished over the prior art. As to claim 99, the traveling wave dielectrophoresis electrode array is considered to be a layer.

As to claims 84, 100, the chip comprises a chamber (see fig. 6 for example.)

As to claims 86, 92, 95 97, 102, 108 and 110, an array of electromagnetic units can move one or more sample components from one area of the chip to one other area

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of the chip by traveling wave magnetophoresis (col. 18, lines 40-50). As to claim 97, electromagnetic element is the electromagnets (col. 18, line 46).

As to claims 87 and 103, a sample applied to the biochip system can remain continuously within the system from the beginning of the first sequential task until the end of the last sequential task performed by the system. (Examiner notes that this limitation relates to intended use and that a sample in the biochip is capable of remaining continuously within the system as claimed.)

As to claims 88 and 104, the biochip system is automated (see for example, col. 18, lines 40-50.)

As to claims 89 and 105 the biochip system comprises more than one chip (col. 2, lines 27-33). (The "microfluidic chips or components" is considered one chip, and the "cartridge" is considered to be a second chip).

As to claims 90 and 106, the two chips can be in fluid communication with one another (col. 2, lines 27-37, and col. 3, lines 8-21).

As to claims 91 and 107, sample components are capable of being moved from one chip to another by a mechanism other than fluid flow. It is noted that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

As to claim 93, the particle switch are connected at a common branch point, that is, where they are controlled, since they are disclosed as being controlled for causing movement of molecules (col. 21, lines 56-67).

As to claim 94, the electrodes of the particle switch are capable of being connected to out-of-phase signals.

Claims 80 and 96 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pourahmadi et al., 6,440,725, in view of Anderson et al., 6,168,948.

Pourahmadi et al. teach the invention substantially as claimed (see above with respect to claims 79 and 95). However, Pourahmadi et al. do not teach that the chip further comprises an acoustic element.

Anderson et al. however disclose a biochip system wherein at least one of the chips (col. 15, lines 57-61) includes an acoustic element for acousting mixing (col. 32, line 41, or acoustic energy for lysing cells, col. 42, lines 19-24). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide an acoustic element as taught by Anderson et al. in the Pourahmadi et al. chip because Anderson et al. teach that it provides the advantages of allowing for mixing or lysing of cells, as may be desirable by one skilled in the art during performance of an assay.

### ***Response to Arguments***

Applicant's arguments have been considered but are not persuasive. Applicant argues on page 9 that Pourahmadi et al. do not report an integrated biochip having a particle switch or traveling wave magnetophoresis structure. This is not persuasive because Applicant has only recited that the particle switch comprises electrodes. Because Pourahmadi et al. teach using multiple electrodes, some of the electrodes are considered to be part of the particle switch and the other electrodes are considered to be part of the traveling wave magnetophoresis. Applicant has not claimed the invention such that it is distinguished over the prior art.

Applicant's argument on page 10 regarding the Anderson et al. reference because the Pourahmadi et al. reference rather than the Anderson et al. reference, is relied upon by the Office to teach the particle switch structures and traveling wave magnetophoresis structures.

Applicant's argument on page 11 regarding the Christel et al. reference is moot because the Christel et al. reference is no longer being relied upon by the Office, in view of the amendments to the claims.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).



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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ann Y. Lam whose telephone number is 571-272-0822. The examiner can normally be reached on Mon.-Fri. 10-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A.L. 

  
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